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About Urban Mega Regions:

Knowns and Unknowns

By

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Abstract

Mega urban regions are not a passing phenomenon. They are likely to persist and to enlarge their economic footprints because they benefit from the advantages of market scale, agglomeration economies, location and the increasing concentration of talented workers. Metropolitan regions which are polycentric, relatively well managed, and have invested heavily in transport infrastructure are able to contain some of the problems attendant upon a concentration of people and industry. Moreover, with energy and water resources becoming relatively scarce and many countries anxious to preserve arable land for farming, the economic advantages of densely populated urban areas are on the rise because they have a lower resource utilization quotient.

During the next 15 years, mega urban economies could coalesce in three Southeast Asian locations: Bangkok, Jakarta and the Singapore – Iskander Development Region (IDR) (South Johor). The Bangkok and Jakarta (Jabotabek) metropolitan regions have passed the threshold at least in terms of population size but they have yet to approach the industrial diversity, dynamism and growth rates of a Shanghai or a Shenzhen–Hong Kong region. Singapore, if coupled with IDR, has the potential but it is still far from being an integrated urban region. This paper examines the gains from closer economic integration and the issues to be settled before it could occur.

The paper notes that a tightening of localized economic linkages between two sovereign nations through the formation of an urban region would involve a readiness to make long-term political commitments based upon a widely perceived sense of substantial spillovers and equitably shared benefits. Delineating these benefits convincingly will be essential to winning political support and a precondition for a successful economic flowering.

About Urban Mega Regions: Knowns and Unknowns

Shahid Yusuf*

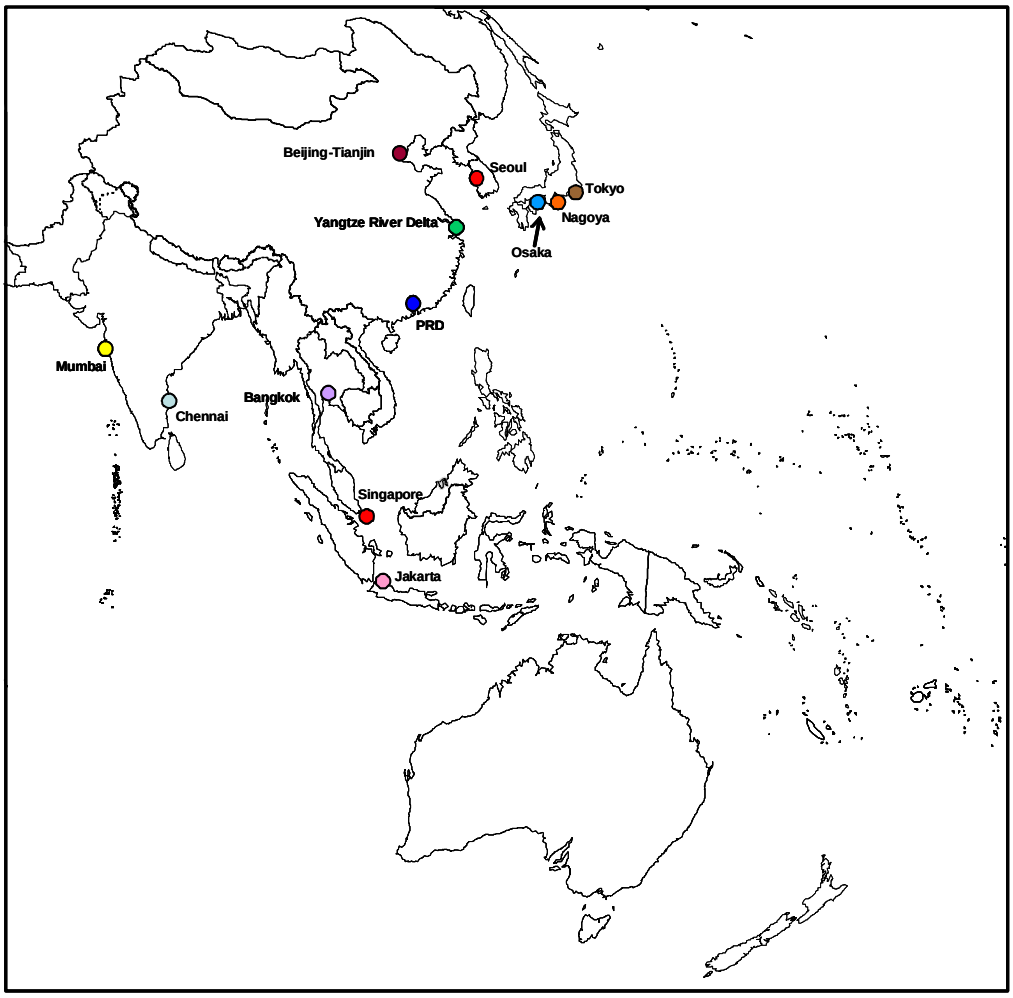
Japan, China and the Republic of Korea accounted for 84 percent of East Asia's GDP in 2005. Within these three countries, just six urban regions generate 45 percent of the aggregate domestic production (see Map 1). Moreover, 42 percent of Korea's population reside in the Seoul–Incheon region and 40 percent of the population of Japan live and work in the metropolitan areas of Tokyo, Osaka, and Nagoya. Because of its size, China's population and industrial production are more evenly distributed. Nevertheless, 80–85 million people, over 6 percent of the total population live in the metropolitan precincts of Shanghai, Beijing-Tianjin and the Pearl River Delta (PRD) excluding Hong Kong and 37 percent of China's GDP originates from the three sprawling regions. The notable characteristics of these urban regions, apart from size, is that they are attracting industries with high value added and are centers of knowledge intensive activities. The mega urban regions are not a passing phenomenon. They are likely to persist and to enlarge their economic footprints because they benefit from the advantages of market scale, agglomeration economies, location and the increasing concentration of talented workers.[1] Being polycentric and relatively well managed, and having invested heavily in transport infrastructure, the metropolitan regions have been able to contain some of the problems attendant upon a concentration of people and industry. Last but not least, with energy and water resources becoming relatively scarce and countries such as China anxious to preserve arable land for farming, the economic advantages of densely populated urban areas are on the rise because they have a lower resource utilization quotient.

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[1] Using PPP rates, PwC estimates that the largest 30 cities in the world were responsible for 16 percent of global GDP in 2005 and the top 100 cities for a quarter of the GDP. Four East Asian cities were among the top 30 – ranked by GDP: Tokyo (1), Osaka-Kobe (7), Hong Kong (14) and Seoul (20). ("PricewaterhouseCoopers" 2007). See also the papers on global city regions in Scott (2001).

Map 1: Major Urban Regions in East and South Asia



Source: World Bank

Are similar urban regions likely to emerge in Southeast Asia and how might they achieve comparable levels of economic performance and technological dynamism? During the next fifteen years, mega urban economies could coalesce in three locations: Bangkok, Jakarta and Singapore – South Johor. The Bangkok and Jakarta (Jabotabek)[2] metropolitan regions[3] have passed the threshold at least in terms of population size but they have yet to approach the industrial diversity, dynamism and growth rates of a

[2] Jabotabek is the metropolitan amalgam of Jakarta, Bagor, Tangerang and Bekasi. Both Bangkok and Jakarta have expanded well beyond the core urban areas into a broad peri-urban fringe to which manufacturing industry has begun to migrate. The Bangkok urban region embraces parts of adjacent provinces. A peri-urban fringe is also expanding around the core Metro Manila region (Jones 2002).

[3] The population of the Jakarta metro region alone now exceeds 13 million, that of Bangkok is 6.5 million.

Shanghai or a Shenzhen–Hong Kong region. Singapore, if coupled with South Johor, has the potential but it is still quite far from being an integrated urban region. However, the possibility at the economic level deserves to be explored. The purpose of this paper is to examine the gains from closer economic integration and the issues to be settled before it could occur. The point of departure of the paper is a glance backward in time at the fusing of the economies of Hong Kong and the Pearl River Delta in China's Guangdong Province. This can help to identify factors which can knit together two separate urban entities into one expansive metropolitan unit and to accelerate growth. I should note at the outset, that the coming together of Hong Kong and the PRD was impelled by geopolitical and historical circumstances which were unique and would be impossible to replicate. A tightening of localized economic linkages between two sovereign nations would involve a readiness to make long-term political commitments based upon a widely perceived sense of substantial spillovers and equitably shared benefits. Delineating these benefits convincingly will be essential to winning political support and a precondition for a successful economic flowering.

1. Hong Kong – PRD Nexus: An Early Success Story

Starting in the early 1980s, the Pearl River Delta embarked on a path to industrialization which has no precedence. Growth between 1980 and 2005 averaged over 16 percent per annum (Yusuf 2007). It is the most successful example of regional development and it transformed what was till then a predominantly agricultural segment of Guangdong, as well as the structure and orientation of Hong Kong's economy. There are valuable lessons to be drawn especially from the 1980s on the remarkable virtuous spiral and how the synergies between the economies of Hong Kong and the Pearl River Delta were realized beyond the dreams of those who initiated the process.

China's cautious and controlled opening to the world economy set the stage for an urban industrial partnership with Hong Kong which had immense consequences for the South China and ensured the future course of reforms in China. At the beginning of the 1980s, Hong Kong derived much of its growth impetus from export oriented, labor intensive, light manufacturing industries (textiles being the largest at 42 percent) which

generated 24 percent of GDP.[4] This industrial base was being constrained by rising wages and the lack of space in which to expand and rising rental costs of apartments and commercial space (Berger and Lester 1997, p. 89; Enright, Scott, and Dodwell 1997, p. 133). Producers in Hong Kong were on the lookout for opportunities which would enable them to shave their costs and expand output to feed growing world demand. Relocating their production first to the four special economic zones (SEZs) established by China in 1979–80 and later to other cities in the PRD was appealing on three grounds: Hong Kong industrialists could move into their natural hinterland and reap the advantages of cultural affinity and kinship ties; the proximity of the PRD reduced the transaction costs and simplified the logistics; and an efficient division of labor was achieved. Factories in the PRD engaged in assembly or manufacturing using local unskilled or semi-skilled workers and intermediate products shipped in from Hong Kong. Meanwhile, the higher value added and skill intensive activities such as finishing, packaging, distribution, marketing, insurance, finance, shipping and more sophisticated manufacturing remained in Hong Kong (Sung and others 1996; Enright, Scott, and Dodwell 1997). In addition, managers, technical staff and plant supervisors from Hong Kong helped to manage the actual production, to train workers, assure quality control and the fulfillment of orders. A new specialization of functions and a supply chain emerged which was advantageous to both sides. Capital and production capabilities transferred from Hong Kong[5] combined seamlessly with entrepreneurship and abundant labor supplies in Guangdong Province to ignite a cycle of growth which almost three decades later shows no sign of dissipating (Enright, Scott, and Chang 2005).[6] Hong Kong gained by focusing on tradable services and becoming the financial heart of the region, by strengthening its headquarters role and expanding its transport functions. As the PRD became more prosperous, the demand for Hong Kong's services grew, including tourism especially from the Mainland. The push of industry and capital out of Hong Kong was reinforced by the pull from an

[4] See Enright, Scott, and Dodwell (1997 p.23). About one-third of the workforce was engaged in manufacturing in 1982 (Howe 1983).
[5] During the 1980s, close to three quarters of FDI in China originated in Hong Kong.
[6] In spite of competition from Shenzhen and Shanghai, Hong Kong remains the major supplier of services to PRD firms. The bulk of these services are linked to trade (86 percent), transportation (3.9), and tourism (7.2). Finance and business services make up the rest. Hong Kong's competitiveness as an intermediary has outweighed the much higher costs (Sung 2006).

underindustrialized, labor rich adjacent region with enormous pent-up entrepreneurial energies and latent demand for manufactures. The Chinese authorities added to the attractions of, first, the SEZs and later the "open" cities in the PRD, by offering generous tax incentives and low rents to joint venture enterprises, and by investing large sums into infrastructure to meet industrial needs. Perhaps most surprising and dramatic was the speed with which manufacturing capabilities took root in the PRD and the steepness of the learning curve. Undoubtedly this process was aided by the transfer of capital equipment, process technology and tacit knowledge from Hong Kong, but local initiative, plus the readiness to assimilate skills and technology was at least equally critical.

The Hong Kong–PRD nexus might not have achieved the momentum it did were it not for the parallel expansion of markets for light manufactures and electronics. This was the result of a fortuitous intersection of three trends: of globalization and the scaling down of trade barriers (World Bank 1999); the increasing size and integration of the Chinese domestic market; and a soaring demand for electronic products assisted by continuous innovation and further impelled by rapidly rising per capita incomes throughout of East Asia.

In sum, cumulative causation advanced the fortunes of both Hong Kong and the PRD in the 1980s because: light manufacturing had reached its limits in Hong Kong and was primed for migration; the PRD offered labor, land and incentives in a geographically adjacent location; industries which moved rapidly struck deep roots and with help of expertise and capital from Hong Kong, became globally competitive. Hong Kong was able to build its capabilities in the areas of services at a time when the tradability of services was on the rise and these activities complemented and supported the development of manufacturing in the PRD; finally, the global demand for light manufactures and electronics rose at an unprecedented rate. The timing was perfect. Hong Kong and the PRD caught the wave as it was beginning to swell and rode it up through the 1980s and the 1990s benefiting all the while from multiple inter–linkages and spillovers.

2. The Mega–Urban Region Payoff

The experience of Hong Kong two decades ago can be instructive for Singapore as it attempts to define industrial and urban strategies to sustain its economic performance, but it does not offer a blueprint. The constraints Singapore needs to overcome are similar to the ones Hong Kong faced. They arise from the limited supplies of land, labor and skills. To compete on almost equal terms with the other urban regions of East and South Asia, Singapore needs to further leverage the advantages of urban scale, agglomeration, industrial diversity and a larger regional market. A way forward, possibly the only viable option, is a cross–national, urban region comprised of Singapore and the South Johor Economic Region of Malaysia, now renamed the Iskander Development Region (IDR).[7] Were such a region (S–IDR) to emerge as a dynamic and interlaced entity, it would have a land area of 2,864 sq. km. and a population of 5.7 million.[8] This would be still a far cry from the scale of the PRD[9] and the urban regions in NE Asia but it would potentially benefit both parties in the medium term and over the long run. This would be predicated on the readiness to improve surface transport connections and links among factor markets.

Although it is difficult on the basis of the available econometric evidence to determine the optimal economic size of a city,[10] there are grounds for claiming that a metropolis which has fewer than 5–6 million people is unlikely to realize the full benefits of scale and agglomeration economies.[11] In fact, as Overman and Venables (2005)

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[7] Integration of the Singapore and Malaysian markets has been ongoing for sometime with investment flows in both directions. Singapore has invested in financial services, telecommunication, healthcare and biotechnology. Malaysian investors have also invested in Singapore. However, these flows have been declining to $405 million from Singapore in 2004 and $617 million from Malaysia ("Malaysia/Singapore: Deal with Spur" 2006).

[8] The land area of Singapore is currently 648 sq. km. that of the IDR is 2,216 sq. km. The population of SJER–IDR was 1.35 million in 2005. Singapore had a population of 4.3 million. Those in the age group 15–64, comprise 67 percent of the IDR's population (South Johor Urbanisation 2006).

[9] The PRD covers an area of over 40,000 sq km and has a population of 41 million (Yusuf 2007).

[10] This is the point at which the marginal social benefits are maximized.

[11] Reviewing the evidence on agglomeration economies, Rosenthal and Strange (2004) find that with each doubling of the size of city, the urban GDP can increase by between 3 and 14 percent. Venables and Rice (2005) estimate that a doubling of the population of a city can raise productivity by 3.5 percent. Henderson concludes from his assessment of the size and productivity of cities in China, that most are sub-optimal in size – i.e. below 5 million (Au and Henderson 2006) – and that productivity gains from an expansion would be about 4.1 percent if the city were 20 percent below optimal but as much as 35 percent if the city is half the optimal size (Henderson 2004; Rosenthal and Strange 2004). While evidence on urbanization economies (arising from industrial diversity) is mixed (and greater for some industries than others), that for

observe, “the available evidence suggests that, at least from an economic perspective being oversized is much less costly than being undersized” (p.27).

When high tech industries and business services (many of them information technology (IT) enabled) are the leading sectors, the scale and diversity of an urban region are increasingly helpful. Urbanization economies – arising from the diversity of activities, skills and providers – are more important for promoting new starts in high tech areas and in producer services.[12] The mega urban region presents the market opportunities – and “a long tail” of promising niches[13] – stimulates interdisciplinary research and interaction among industrial subsectors and is more hospitable to the emergence of new clusters.[14]

A key factor favoring the large urban region is frequently the availability of local finance, particularly venture capital and funds from angel investors. These have proven vital for the growth and resilience of the clusters in Silicon Valley, Boston and Cambridge, U.K.[15] A second key factor is the presence of research universities and research institutes either public or affiliated with major local firm or MNC.[16] These are not only a source of much needed technical skills and knowledge spillovers, they are emerging also as essential sources of consulting services, patents, tacit knowledge and entrepreneurship which are critical to the success of basic science and IT-based industries

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diversity of high tech industries is much clearer. Overman and Venables (2005) find that a one standard deviation increase in the diversity index raises productivity by 60 percent (p.18). See also Lall, Shalizi, and Deichmann 2004; Deichmann and others 2005).

[12] A summary of the literature on localization economies is contained in Overman and Venables (2005). A study for Korea suggests that “a 1 percent increase in own industry employment increases productivity by 0.08 percent, i.e., moving from a city with employment of 1000 to a city with 10,000 would raise productivity by over 70 percent” (p.18).

[13] See Anderson (2006) on the opportunities presented by the “long tail”.

[14] Co–location of component and module suppliers to assemblers which permit J-I-T delivery and reduce time costs as well as the advantages which accrue from collaboration, research and design of products, both favor proximity among producers and suppliers – factors which further strengthen agglomeration effects (Harrigan and Venables 2006; Hillberry and Hummels 2005). Knowledge intensive industries are becoming more concentrated in areas where there is an abundance of skilled and technical workers (Midelfart-Knarvik and others 2000).

[15] The role and history of venture capitalism (VC) in Silicon Valley and its contribution to the revival of the Valley’s fortunes when one industrial cycle ended and a new one commenced is described by Kenney and Florida (2000) and Kenney and Patton (2005). In 2004, one quarter of the venture capital in the U.K. and 9 percent of all European VC was absorbed by firms in Silicon Fen around Cambridge, U.K. This is now the second largest VC market in the world after Silicon Valley, ("Silicon Fen" 2006).

[16] In the U.S., the major federal laboratories are better able to conduct interdisciplinary research and can afford expensive equipment and facilities. Universities have the advantage of a steady flow of students which affect the nature and culture of research (Bozeman 2000).

(Yusuf and Nabeshima 2007).[17] World class universities are most often located in the major European and North American cities and in East and South Asia, they are overwhelmingly to be found in the capital cities or the very largest urban centers. The ability of these regions to retain talent by providing attractive jobs, amenities, social services and housing is, as Richard Florida has noted, a necessary condition for their economic success (Florida 2005a; Florida 2005b; Florida 2002;).[18]

The bane of the mega city is congestion and the associated transport costs, environmental pollution, and higher living expenses. Other problems can arise from the lack of inter-jurisdictional coordination, from weaknesses of governance, from the difficulties in attaining the desired level of fiscal effort, and raising funds from capital markets and the often daunting challenges of managing the finances of a metropolis.[19] These last three are not only related to the size of cities. Furthermore, research has uncovered no clear relationships between size and environmental pollution.[20] However, rental costs do tend to be higher in the mega city, which affects wages and hence, induces some low value adding and land intensive activities to migrate to the suburbs or smaller cities.[21]

Transport and commuting costs are a separate matter and for these there are solutions. First urban intensity can be a plus in that it increases the cost effectiveness of

[17] There is a rich literature accumulating on this topic. Bettencourt, Lobo, and Strumsky (2007) find evidence of super linearity in patenting among metro regions in the U.S., that is larger regions generate more patents.

[18] Our own recent research and that of Florida (Yusuf and Nabeshima 2007; Florida and others 2006) and his co-workers has made clearer the seminal role that universities are likely to play in the knowledge economy of the future (O'Mara 2005; Etzkowitz 2002). The university is becoming the axis of a creative hub not only generating the knowledge which underpins innovation but also in mobilizing talent, testing ideas and creating a "tolerant social climate". Florida's study of Sweden's regions shows that regional development was keyed to the contribution of universities, first but also the provision of amenities and services (Mellander and Florida 2006). Ireland's economic success which is closely related to the flow of FDI was primarily the consequence of a ratcheting upward of the supply of technical graduates. It spent little on research and innovation but Ireland has the highest number of students in the EU enrolled in scientific subjects (Crafts 2005).

[19] It is important not to forget the qualifications. Large cities need not be more productive or competitive unless they can muster the industrial, innovative, management and other capabilities and create the environment conducive to growth. As a recent OECD (2006) study indicates, of 44 metro regions less than half exceeded the national average growth rates.

[20] There is relatively little evidence on city size and air pollution. Overman and Venables (2005) report that in developing countries both sulphur dioxide and particulates trace an inverted U shape first rising with size and then falling.

[21] See Overman and Venables (2005).

bus and rail based public transport systems which are also energy efficient – a non-trivial consideration in a world faced with a tightening of energy supplies. Second, an adequate investment in road infrastructure side by side with road user and parking charges can reduce congestion costs. Third, a polycentric urban system[22] with zoning for mixed use can distribute traffic more evenly and avoid peak time gridlock. Mixed use of buildings increases the efficiency with which urban physical assets are utilized, while also contributing to the security and social life of neighborhoods.

For middle and high-income economies which are shifting towards skill intensive activities, the weight of empirical evidence, especially in the East Asian context, favors the polycentric large urban regions. They appear to have the edge in terms of competitiveness, knowledge generation, new starts and productivity. Moreover, looking ahead, this advantage is likely to widen as the greater relative scarcity of energy and water encourage urban scale and densities as against a more dispersed pattern of urbanization. Past experience which underscores the role of small and medium sized cities and of "localization economies" arising from urban specialization on single manufacturing industries, might be increasingly less relevant.

3. *S–IDR: Complementarities and Issues*

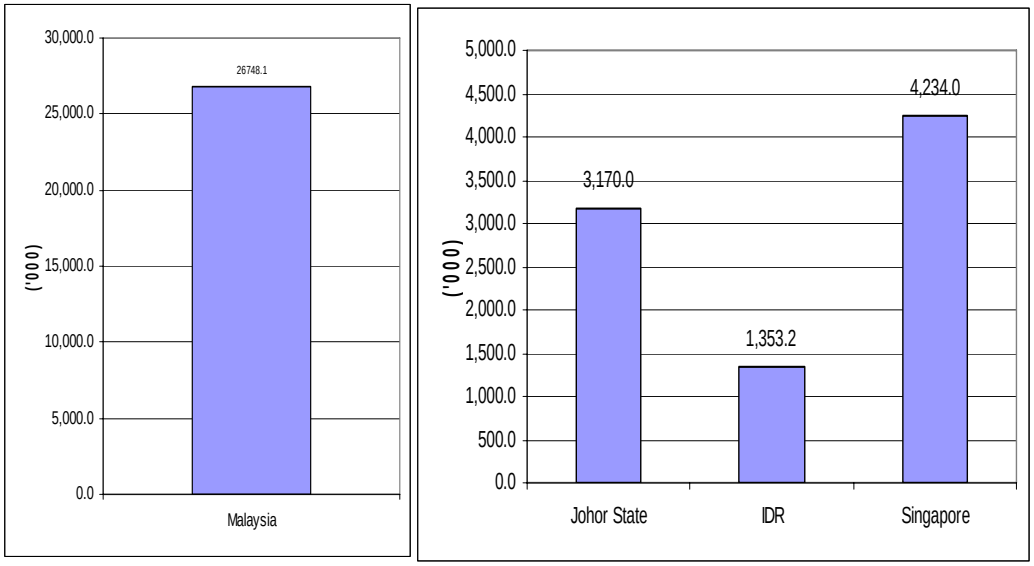
Do Singapore and IDR have the makings of a dynamic urban region? On the positive side of the ledger, there are five factors: first, as already noted, the combined entities would have a much larger pool of labor – an important consideration – with a favorable age distribution, the space to grow new industrial activities and to accommodate both the natural increase of the urban population as well as migrants (see Figure 1 and Figure 2). The mutually beneficial objectives of achieving greater productivity and industrial diversification are more likely to be realized.

Second, given the overlapping industrial composition of the two urban areas, with a focus on the electronics, telecommunications and chemical industries, over time the

[22] Polycentric regions can benefit from synergies and external economies, however these are a function of the degree of complementarity between the different parts and the closeness of inter-jurisdictional cooperation. The degree to which the benefits from polycentricity have been realized in the Randstad region of the Netherlands is discussed by Meijers (2005).

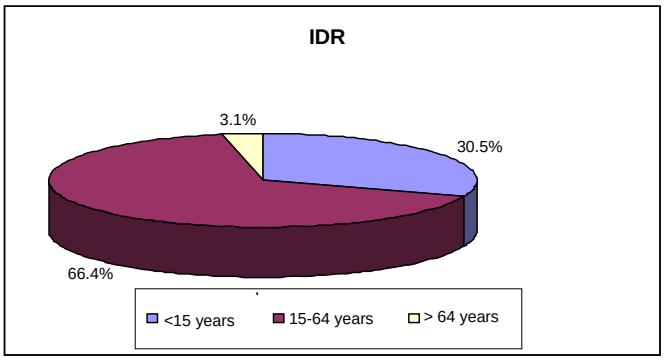
land intensive and more standardized industries could relocate from Singapore to the IDR (see Figure 3).[23]

Figure 1: IDR Population Size (2005) – National and Regional Comparison



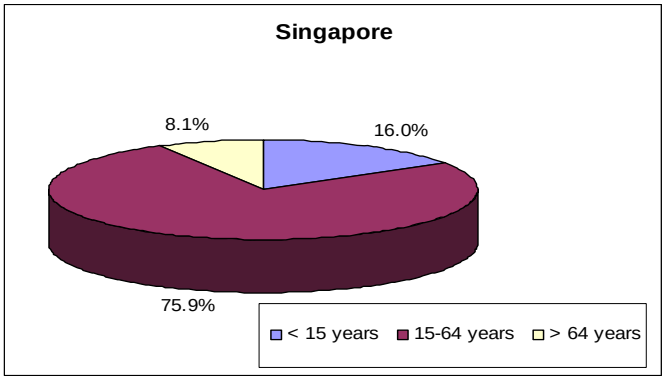
Source: Projected from Census (2000) figures.

Figure 2: Composition of Age Structure (2005) – National and Regional Comparison



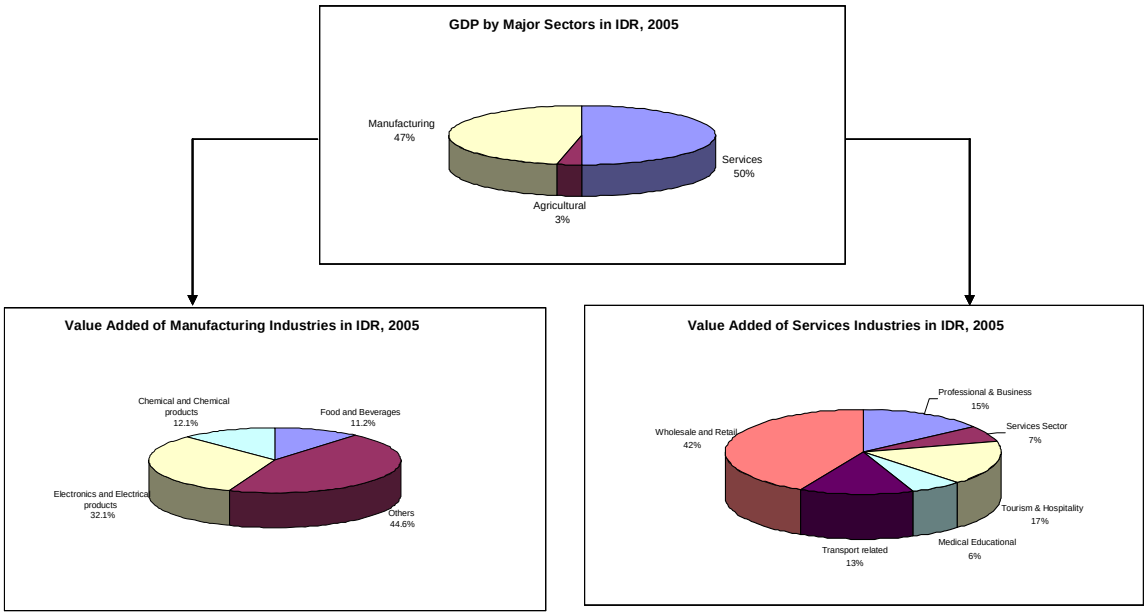
Source: State/District Data Bank 2005

[23] Kenney and Patton (2007) find that industrial clustering and the proximity of venture capitalists is greater for electronics and telecommunications – the main manufacturing industries in S–IRD than for bio-technology.

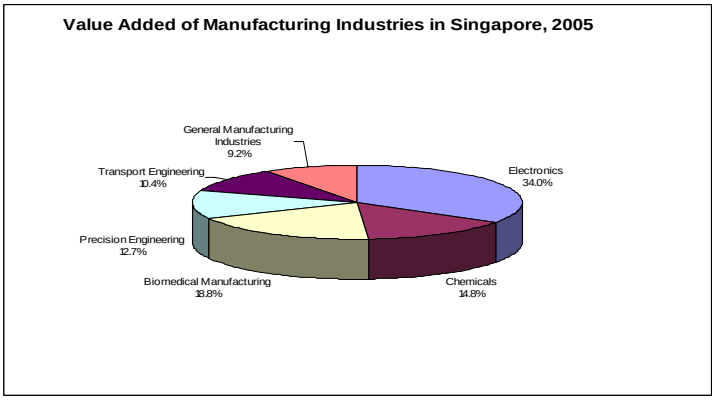


Source: Singapore Statistic (Sing-Stat)

Figure 3: Economic Structure of IDR and Singapore (2005) – GDP by Major Economic Sectors



Source: South Johor Economic Region: Comprehensive Development Plan, 2006-25.



Source: Economic Development Board

Third, Singapore's highly developed business and financial services sector would encourage new starts in the IDR and could increase the flow of FDI into South Johor.[24] Fourth, the growth of the urban region and its industries would enhance its role as a logistics hub. This would steadily raise the traffic through Changi and Senai International airports and the ports of Singapore and Tanjung Palepas and increase jobs in logistics related as well as other activities.

Fifth, the urban region could foster the expansion of tertiary level training institutions which would feed the pool of skills, an essential precondition for industrial diversification and the strengthening of a knowledge economy.[25]

While the above factors present the positive side of the story, the outcome would be influenced by a number of other considerations arising from the degree of urban integration and the distribution of gains, which argue for a tempering of expectations.

First, there are few if any instances of cross border urban regions or cross border industrial clusters. One example of the latter is the Medicon Valley biotech cluster which straddles the Skane region of Sweden and the greater Copenhagen metropolitan area.[26] This has achieved prominence as a result of intensive R&D in the life sciences by universities in the region and the presence of research labs and production facilities of Novo Nordisk, AstraZeneca and H. Lundbeck (Boston Consulting Group 2002). The U.S. Mexican border areas are another distant example. By and large national borders can interfere with the closeness of industrial and other linkages, inter-jurisdictional coordination and with the joining together of labor markets.[27] These divisions can impede the formation of coherent urban regions and discourage the relationships among firms

[24] See Bresnahan and others (2001) on the "Old" economy inputs. The technology spillovers from FDI are likely to be greater in the S–IDR region because of the higher proportion of skilled workers and the well developed local capital market. (see Alfaro and others 2006). The experience from Ireland suggests that the productivity gains for domestic firms rises, the larger the number of workers employed by foreign firms (Crafts 2005) and the greater the relative productivity of the foreign firms (Peri 2004). In other words, if the formation of the S–IDR region could increase the inflow of FDI, longer term productivity benefits would be enhanced.

[25] Tertiary level institutions in Johor include the University Technological Malaysia, the University Technology MARA, a college university and several polytechnics ("Johor" 2007).

[26] Medicon Valley (Boston Consulting Group 2002) is a cluster of over 350 firms of which 140 are biotech firms and 70 are pharmaceutical firms with 1,500 researchers.

[27] Dense and integrated labor markets reduce the transaction costs of job search and hiring and facilitate technology transfer through job hopping (Fallick, Fleischmann, and Rebitzer 2005; Overman and Venables 2005).

which promote clustering. We should note though that the Hong Kong and PRD labor markets remained separate in the 1980s and that firms in Hong Kong were able to forge close relationships with suppliers, joint ventures and other firms across the national border in China.

A second factor, which relates back to the experience of Hong Kong, concerns the movement of industries out of Singapore into the IDR. Are the electronics and chemical industries in Singapore at the stage when they are ready to migrate a short distance across the straits? Are the push factors, the higher wages and rental costs present in Singapore? Will they remain among the fastest growing manufacturing subsectors? And would this shift help to sustain the global competitiveness of these industries for some time in the IDR even though the greater integration of the cross border labor market would lead to an upward drift of wages on the Malaysian side? The question for Singapore is that if these industries do migrate, what will take their place and provide employment for laid off workers?

A third factor, which follows closely from the one above, is the likelihood of other new industries migrating to the IDR from the industrialized countries. The PRD was the beneficiary of the transfer of a wide range of light industries from advanced economies and elsewhere in East Asia. Is another round of industrial migration in the offing and if so, which industries are likely to be affected and in which part of the new urban region would they locate?[28] From the perspective of the Singapore–IDR urban region, light industries are no longer attractive or viable. The ones which are most likely to be competitive are higher value adding manufacturing activities and services. There is certainly significant long run potential in electronics components, in engineering and in biotechnology industries. There is also potential in a variety of IT enabled activities. The trouble is that these are all skill, capital and in some instances, research intensive industries that depend on innovation for their survival. China and India are competing for

[28] Whether a new wave of innovation is gathering momentum in the life sciences, in nanotechnology, in new materials or in alternative energy sources, is far from obvious. And while nanotechnology and solar power open promising vistas, exploring these and commercializing innovations will be a slow process. (Uskokovic 2007; Bradford 2006; Yusuf and Nabeshima 2006). Were a wave of creative destruction to gather momentum, an industrial shakeout could commence a new round of industrial development comparable to the electronics and IT revolution (Jovanovic and Tse 2006). How this would affect Southeast Asia and how rapidly is open to conjecture.

the lower and middle end of these activities; Korea, Japan, the U.S. and European countries for the upper end. Would the Singapore–IDR region be able to acquire a portion of the higher value activities initially through FDI with new starts by local entrepreneurs becoming more important down the road? This would depend upon the volume and composition of FDI flows induced by the region and the linkages or knowledge spillovers generated by foreign firms. It would also, and crucially, be a function of skills and risk capital concentrated in the urban region which is the fourth factor, I will note below.

Skill intensity is on the rise in a wide range of middle and high tech activities (de Ferranti and others 2003) Many different kinds of skill are involved. There are the skills of entrepreneurs who establish businesses and of mangers who run these and oversee operations oftentimes on a global scale. There is the expertise needed to produce and to market. There are myriad services needed to support industry from lawyers, accountants and others and there are the technical inputs which determine the quality of R&D and which transform the fruits of research into innovative and commercially viable manufactures. The longer term competitiveness, adaptability and growth of urban region a Singapore–IDR region will rest on the quality of the workforce. Numbers matter of course, but the level and quality of skills will be decisive in attracting and retaining a changing portfolio of innovative manufacturing and services industries. Fundamentally, this is a function of the volume of investment in secondary and tertiary skills development, and how responsive institutions are to meeting market demands for skill mix and quality standards. It is a function of the flexibility of the labor market and how quickly labor moves from declining to new and promising activities. And it is a function of the openness of the urban system to diversity, to fresh ideas, and to risk taking by entrepreneurs.

Skills are one part of the equation, capital and also importantly the providers of capital, are another. Investible resources are often less of a constraint than other factors such as: venture capitalists who mobilize risk capital, seek out promising companies, motivate them to perform and help launch them through IPOs; angel investors who assist and coach start-ups, provide them with specialized knowledge and help them to find valuable contacts and to network; scientist entrepreneurs who are a source of commercializable scientific knowledge, have the reputation which enables them to raise

capital and to take risks and the drive to launch new companies;[29] and large MNCs (Multinational corporations) or national companies which because of their organizational culture and strategies induce start-ups as Hewlett-Packard and Fairchild did in Silicon Valley, companies such as Cisco have encouraged through their multiple acquisitions, and others have triggered through intrapreneuring (Pinchot and Pellman 2000).

There are other potential constraints which are not relevant for Singapore–IDR urban regions, such as location,[30] physical infrastructure, and energy supplies. All of these are either inapplicable – such as location – or readily surmountable given the infrastructure already in place and the access to capital.

4. Making an Urban Region Competitive: Recipes and Open Questions

The above assessment brings us to the following conclusions and questions. A Singapore-IDR urban region, were it to coalesce and acquire the needed multiplicity of industrial, commercial and administrative linkages, would benefit from a variety of agglomeration and other economies which promote productivity. There exists a degree of complementarity between the two economies which would induce an efficiency raising rationalization of activities. The region has the transport infrastructure and the international connectivity which has become so critical to reducing time and transaction costs in a globalizing world. The region is strategically situated with respect to the vast and growing markets in both Southeast and South Asia. An early start in acquiring new urban–industrial capabilities would give the metropolis an advantage over the urban regions in Thailand, Indonesia and India. Those areas are at a less advanced stage of development, do not have the green fields potential of the IDR or lack the state-of-the art transport systems, and are saddled with legacy problems arising from inadequate urban planning, insufficient investment in infrastructure, housing and public services, urban poverty and entrenched slums. In other words, there is no obvious economic downside to

[29] Zucker and Darby (1995); "Broers, Lord Alec" (2005).

[30] Mellinger, Sachs, and Gallup (2003) find that “temperate ecozones proximate to the sea account for 8 percent of the worlds inhabited land area, 23 percent of the world’s population and 53 percent of the world’s GDP (p.169). Singapore – IDR have the advantages of a coastal location and investment in infrastructure, air conditioning and public services have negated the problems noted by Mellinger, Sachs, and Gallup (2003). However, whether a coastal location retains its attractions as sea levels rise, only time will tell, but the certainty that they will rise to some extent should be factored into investment plans and the search for remedial technologies.

the knitting together of an S–IDR urban region and the potential longer run gains are substantial, although there is the possibility of adjustment costs during a period of transition. But making it happen will require delicate and detailed political negotiations sustained by goodwill and a readiness to compromise on the part of both sides. National commitments will need to be matched with local commitments anchored to a firm belief in mutual advantage, a realistic appraisal of alternatives, and an acceptable sharing of benefits.

But this will not be the end of the story. The Singapore–IDR urban region will face four major questions, and it is only by addressing these fully that it will be able to achieve rates of growth comparable to those of urban regions in China and elsewhere.

One set of questions pertains to industrial positioning and measures which would create a "nursery" for local start-ups (Duranton and Puga 2001). The Malaysian authorities have acquired valuable experience in developing SMEs (Small and Medium Enterprises) through their decade long efforts in building an ICT cluster in the MSC. Almost 3,500 SMEs were operating in the MSC by July 2005 ("Multimedia Super Corridor" 2006). Where lies the dynamic comparative advantage of the region? What are the manufacturing industries and services which would need to be groomed in the interest of future growth given the likely trends in technologies, relative wages and other costs? What mix of public and private actions and provision of collective goods will raise a crop of SMEs which are geared to the flexible specialization which is needed for survival in a technologically fluid world (Humphrey 2003; Asheim 2000).

A second question is about the capacity and the capabilities to produce and to attract a range of production and research skills which are equal to the best in Northeast Asia or Europe or the United States. Can this be done for the new region as a whole and how will it be done? Without it, the combination of Singapore and the IDR would not yield longer term results.

A third question is about how to find the angel investors and the experienced entrepreneurs who will provide the backbone of the industrial system, looking forward. Some of these will be drawn from the ranks of wealthy industrialists from Singapore and Malaysia and from the region. Many others must emerge from MNCs and research centers. Old style start-ups (in manufacturing and high tech services) by individuals with

limited skills and education but a good nose for business could become the exception as the urban region becomes technologically more sophisticated; the majority of businesses will be run by talented people who also tend to hire people well equipped with skills.[31]

The last question follows from the above three: the Singapore-IDR urban region will need to be innovative to compete and catalyze clusters as the "dedicated silicon fab" was able to do for Hsinchu Park (Chen 2007).[32] Sustained innovativeness is of a different order from the technological learning during the catch-up phase. It requires a high level skills and heavy spending on R&D backed by incentives and checks which maximize the flow of innovation. While the resources ploughed into research surely matter, there are no ready answers to the above questions but it is only by tackling them that an urban region could clear the political handles and come to grips with economic opportunities. If the S–IDR region is to reap the advantages of an early start over its rivals in Southeast and South Asia, there is little time to lose. Innovativeness depends seemingly also on a local culture which tolerates questioning and a healthy amount of dissent; on a circulation of talented people many from outside the region who inject new ideas and stimulate new thinking; and on incessant networking and collaboration by knowledge workers in the urban region with their peers around the world. Innovation is increasingly done by teams and less and less by the lone inventor.[33]

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[31] See Berry and Glaeser 2005.

[32] As recently as 2006, Singapore was rated as the leading Asian city with respect to the quality of life, a significant advantage where knowledge based development is the objective ("Singapore Ranked 'Top Asian City' for Expats" 2006). Moreover, according to 2D Net Asia's Top Tech Index, Singapore was the preferred location for high tech companies locating in East Asia ("Singapore Outranks China, Hong Kong" 2005).

[33] The Internet and increase specialization have prompted much more collaborative research and joint publication in the natural and social sciences. Moreover, although national and regional innovation systems still have primacy, corporate research is becoming more globalized with large MNCs taking the lead in sourcing research from different parts of the world, setting up laboratories in different countries, creating multinational research teams and entering into far flung research alliances (Carlsson 2006; Gerybadze and Reger 1999).

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